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## THE INCREASING EFFICIENCY OF OUR CITY SCHOOL SYSTEMS

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LEONARD P. AYRES  
Russell Sage Foundation

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Ten years ago, when school superintendents were keenly interested in the progress of the pupils through the grades, the Department of Education of the Russell Sage Foundation conducted a co-operative study based on the school histories of more than 200,000 children in twenty-nine city school systems. At the close of the school year, in 1911, the school authorities of these cities collected data for all the children in the elementary grades showing their ages, their grades, and the number of years that they had been attending school. All the figures were gathered at the same time, by the same methods, on uniform blanks. The findings of the study were published in a series of four articles entitled "The Identification of the Misfit Child," "The Relative Responsibility of School and Society for the Overage Child," "The Money Cost of the Repetition versus the Money Saving through Acceleration," and "The Relation between Entering Age and Subsequent Progress among School Children." All of these articles were written by the present author and they ran through a series of some eleven reprintings.

In the spring of 1920 the Russell Sage Foundation invited the superintendents of schools of the same cities to repeat the earlier study in order that some estimate could be made of the progress attained during the interim. Fifteen of the systems accepted the invitation, and the records were again gathered by the same methods and with the same blanks as were used in the earlier investigation.

The results reflect a general improvement that has taken place in the effectiveness of school systems in carrying their pupils through the grades. The proportion of pupils reaching the eighth grade is larger than it was in 1911. The overage children and

those making slow progress are fewer now than they were then. The number of repetitions of grades has been reduced, and the figures give good evidence that many more children now go through the schools on schedule time and at schedule age than was formerly the case.

#### THE AGE AND PROGRESS CLASSIFICATION

The data gave the age, the grade, and the years of schooling of each child. A pupil who was seven years old and in the first grade was considered as being of normal age, and one year was added for each advancing grade. This arrangement of the facts made it possible to classify each child with regard to both his age and his progress. In regard to age he was either younger than

TABLE I  
SCHOOL CHILDREN BY YOUNG, NORMAL, AND OLD, AND  
BY RAPID, NORMAL, AND SLOW GROUPS. PROGRESS  
AND AGE FIGURES SHOWING AVERAGE CONDITIONS  
FOR FIFTEEN CITIES IN 1911

	Young	Normal	Old	Total
Rapid.....	6	3	2	11
Normal.....	20	21	11	52
Slow.....	2	9	26	37
Total.....	28	33	39	100

normal, of normal age, or older than normal. With respect to progress he was classified as either rapid, normal, or slow, and since both age and progress were recorded, and there were three groups in each classification, every child was finally assigned by his record to one of nine different classes. These nine different classes are shown in Tables I and II which are the final summaries of the two investigations in so far as they relate to the fifteen cities repeating the study. The children for whom data were gathered numbered 83,283 in 1911, and 111,680 in 1920.

The data of Table I show how 100 typical children were distributed according to their ages and the progress they had made in the earlier year. Six of them were both younger than normal for their grades and had made more than normally rapid progress.

The twenty-one who appear in the center of the table were of normal age and had made normal progress. The group of twenty-six in the lower right-hand corner represent the children who clog the grades with repeaters, furnish the recurrent failures, and fall out without finishing. They were the children who were both overage and had made slow progress.

The total number of overage or "old" pupils was thirty-nine in each hundred, while those who had made slow progress were thirty-seven in each hundred. It is noteworthy that while these two percentages, representing the overage and the slow children, are about equal, the two groups consist in considerable measure of different individuals. This was one of the most important

TABLE II  
SCHOOL CHILDREN BY YOUNG, NORMAL, AND OLD, AND  
BY RAPID, NORMAL, AND SLOW GROUPS. PROGRESS  
AND AGE FIGURES SHOWING AVERAGE CONDITIONS  
FOR FIFTEEN CITIES IN 1920

	Young	Normal	Old	Total
Rapid.....	10	2	1	13
Normal.....	28	23	7	58
Slow.....	2	9	18	29
Total.....	40	34	26	100

findings of the earlier study, for prior to that time it had been commonly assumed that the terms "slow" and "overage" were practically synonymous and could be used interchangeably in referring to the same children.

The data of Table II show that conditions in 1920 were better than in 1911. The children who were both young and making more than normally rapid progress had increased from six in each hundred to ten in a hundred. Those in the center of the table, of normal age and making normal progress, had increased from 21 per cent to 23 per cent. The most important change is that in the figures in the lower right-hand corner which show that the unfortunate misfits who were overage and making slow progress had diminished from 26 per cent to 18 per cent.

During the nine years the percentage of overage children had fallen from 39 to 26, and the proportion of slow pupils from 37 in each hundred to 29 in each hundred. These improvements are large and important. They represent educational economics, financial saving, and human conservation.

#### PUPILS UP TO SCHEDULE AND BEHIND

Table III gives the data of Table I and Table II in convenient, comparative form and groups the nine tabular classes in two categories of which the first includes the cases from the four compart-

TABLE III

NUMBER OF PUPILS IN EACH HUNDRED UP TO SCHEDULE AND NUMBER BEHIND SCHEDULE IN 1911 AND 1920. AVERAGES FOR FIFTEEN CITIES

	1911	1920
Pupils who are up to schedule or ahead of it		
Those who are young and making rapid progress.....	6	10
Those who are young and making normal progress.....	20	28
Those of normal age who are making rapid progress.....	3	2
Those of normal age who are making normal progress.....	21	23
Pupils who are behind schedule		
Those who are overage and making rapid progress.....	2	1
Those who are young and making slow progress.....	2	2
Those who are overage and making normal progress.....	11	7
Those of normal age who are making slow progress.....	9	9
Those who are overage and making slow progress.....	26	18
Total up to schedule or ahead.....	50	63
Total behind schedule.....	50	37
Grand total.....	100	100

ments in the center and upper left-hand corner of the two previous tables, and brings together the pupils who were up to schedule or ahead of it with respect to both age and progress. The second category brings together the cases from the other compartments of the threefold tables and represents the pupils behind schedule. The totals at the bottom of Table-III show that in 1911 half of the children were up to schedule and half behind it, while in 1920 nearly two-thirds were up to schedule and only a little more than one-third behind.

## THE STANDING OF THE CITIES

The method used in compiling Table III provides a convenient means for finding out what proportion of the pupils in each city are up to schedule in the sense of having made normal progress, or better, and being at the same time of normal age, or younger. Table IV gives the percentage of pupils who were up to schedule in both progress and age in the fifteen cities in 1911 and in 1920, and the change during the nine-year interim. The cities are arranged in the order of the gain in the percentage figures.

TABLE IV

PERCENTAGE OF CHILDREN UP TO SCHEDULE IN BOTH AGE AND PROGRESS IN FIFTEEN CITIES IN 1911 AND 1920 AND CHANGE IN THE PERCENTAGE DURING THE PERIOD

City	Percentage of Pupils up to Schedule in 1911	Percentage of Pupils up to Schedule in 1920	Change in Nine Years
Montclair, N.J. ....	40	71	31 gain
Elizabeth, N.J. ....	39	65	26 gain
Quincy, Mass. ....	52	77	25 gain
Passaic, N.J. ....	43	65	22 gain
Schenectady, N.Y. ....	45	65	20 gain
Bayonne, N.J. ....	48	67	19 gain
Topeka, Kan. ....	55	69	14 gain
New Orleans, La. (white) . . . . .	44	57	13 gain
Danville, Ill. ....	53	65	12 gain
Watertown, Mass. ....	46	54	8 gain
Muskegon, Mich. ....	57	64	7 gain
Racine, Wis. ....	63	69	6 gain
Plainfield, N.J. ....	48	51	3 gain
Hazleton, Pa. ....	46	45	1 loss
Amsterdam, N.Y. ....	69	64	5 loss
Fifteen cities. ....	50	63	13 gain

## FOUR SETS OF COMPARISONS

Table V presents four sets of comparisons between the records of the fifteen cities in 1911 and the corresponding figures for 1920. The first double column gives the percentage of pupils who were above the normal ages for their grades. The average for the entire group was 39 in 1911 and it had fallen to 26 in 1920. The greatest gain was that made by Passaic, while the best record in 1920 is that of Quincy, with only 14 per cent of overage pupils.

The second double column gives the data for the percentage of pupils making slow progress. Here the average in 1911 was 37

and in 1920 only 29. The city making the greatest improvement is Quincy, where the number of slow pupils diminished in the nine years from 44 in each hundred to only 17.

The third double column gives computations for the percentage of pupils reaching the eighth grade. To obtain these figures the number of beginning pupils was estimated by averaging the age-groups from seven to eleven, inclusive, and also averaging the five groups of pupils who had been in school each number of years

TABLE V

COMPARATIVE DATA FOR FIFTEEN CITY SCHOOL SYSTEMS IN 1911 AND IN 1920

	Percentage of Pupils Overage for Grades		Percentage of Pupils Making Slow Progress		Percentage of Beginners Reaching Eighth Grade		Years Lost for Each Year Gained	
	1911	1920	1911	1920	1911	1920	1911	1920
Amsterdam.....	28	25	21	26	62	44	.9	1.9
Bayonne.....	42	22	35	24	50	69	2.5	1.0
Danville.....	38	27	38	29	68	61	7.3	2.3
Elizabeth.....	46	25	40	25	43	64	3.8	1.4
Hazleton.....	42	41	44	46	47	50	20.5	12.4
Montclair.....	48	20	45	21	66	71	8.3	1.3
Muskegon.....	35	24	31	30	77	73	3.2	6.9
New Orleans.....	49	34	36	31	36	55	3.2	2.7
Passaic.....	51	26	38	26	28	42	3.6	2.3
Plainfield.....	40	36	38	43	59	50	7.3	17.3
Quincy.....	19	14	44	17	87	83	14.2	1.4
Racine.....	28	20	28	25	78	76	10.8	2.5
Schenectady.....	44	21	39	27	44	71	4.6	3.4
Topeka.....	36	22	31	22	68	82	3.0	1.9
Watertown.....	43	34	41	35	63	61	5.2	2.8
Fifteen cities.....	39	26	37	29	50	62	3.8	2.4

from two to six, inclusive. These two results were then averaged and taken to represent the probable number of beginning pupils.

The theory behind this is that the number of pupils beginning school each year in a system is about equal to the number of children in the system of any given age within the compulsory-attendance period. Again, the number of beginners is about equal to the number who have been in school for a stated number of years, say two, or three, or four. In the present case five measures of each sort have been taken and the average of all ten used to represent the number of beginners in the system.

On this basis the percentages of survivors have been computed by comparing the eighth-grade membership with the number of beginners. The percentage of beginning children who survived to the eighth grade is computed to have been 50 in 1911, and to have increased to 62 by 1920. The city making the greatest improvement is Schenectady where the survivors increased from 44 per hundred in 1911 to 71 in 1920. Quincy and Topeka show the best records in 1920, with percentages of survival of 83 and 82, respectively.

In the last double column are figures showing how many years were lost by the slow pupils for each one that was gained by the rapid pupils. In 1911 the ratio was 3.8 years lost for each one gained, and in 1920 it had fallen to 2.4 lost for each one gained. The greatest improvement appears to have been made by Montclair and Quincy where the disproportion between years lost and years gained was formerly seriously great and has now been reduced to almost nothing.

#### SIXTH-GRADE PUPILS AND TWELVE-YEAR-OLD PUPILS

In the attempt to measure still further the changes that have taken place two more tests have been applied to the data for the fifteen cities combined. The first consisted of computing the average age of all the sixth-grade pupils for the two years. In 1911 this was 12.6 years, and in 1920 it had fallen to 12.0 years, showing that the pupils of this grade are now distinctly younger than they were formerly.

The second test consisted of computing the average grade of all the twelve-year-old children, it being noted that twelve years of age is the normal age for pupils in the sixth grade, and the last age before pupils begin to drop out or to enter high school in large numbers. This test showed that the average grade of all the twelve-year-olds in 1911 was 5.1, and that by 1920 it had increased to 5.8. The figures indicate that the pupils who are twelve years of age have made distinctly better progress than they did formerly.

#### NOT ALL CITIES IMPROVE

The results of the investigation show that, if we consider these fifteen cities as a group, conditions relating to the progress of the children have improved in large measure since 1911. A close



analysis of the records of each city discloses the fact that this improvement has not been uniform and that some six among the fifteen cities show little improvement or even signs of going backward.

The educational experience of the past fifteen years has abundantly demonstrated that continued improvement in these matters largely depends on keeping track of the progress of the individual children and carefully checking up the results at frequent intervals. The remedies for retardation and elimination are largely the products of child accounting. American education and American children would greatly benefit by a revival of interest in studies of the progress of children.

In the opinion of the author we should do well to welcome back to our investigations and discussions the old terms of retardation, elimination, progress, and survival, even if we had to make way for them by sacrificing some correlations, attenuations, regressions, coefficients, and other verbiages of mental testing.

#### SUMMARY

1. In 1920 the Department of Education of the Russell Sage Foundation, in co-operation with the school superintendents of fifteen cities, repeated an age and progress study that had been made in the same cities in the same way in 1911.

2. Data were gathered giving the ages, grades, and years of schooling of the 111,680 children in the elementary grades of these systems in 1920, and the results were compared with similar data for the 83,283 children in the same schools in 1911.

3. A comparison of the results of the two studies shows that conditions affecting the progress of children through the grades have greatly improved.

4. The proportion of children up to schedule with respect to both age and progress has increased from 50 per cent to 63. The proportion of overage children has decreased from 39 per cent to 26, and that of children making slow progress from 37 per cent to 29. The percentage of beginning children who reach the eighth grade has increased from 50 to 62.

5. These changes represent greater efficiency on the part of the schools, economy of the resources of the taxpayers, and conservation of the opportunities of the children.